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CIC biomaGUNE
CENTER FOR COOPERATIVE RESEARCH IN BIOMATERIALS

seminar

Thursday, 5th September, 12.00 pm, Seminar Room

Host: Dr. Jesús Ruiz-Cabello

Multilateral understanding of the host-pathogen interplay at the human airways towards development of innovative therapeutics

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Respiratory diseases are a major threat to public health, with chronic obstructive pulmonary disease (COPD) and lower respiratory tract infections (LRTI) in positions 3 and 4 of the top 10 leading causes of death worldwide. COPD is an irreversible decline of lung function caused by long-term exposure to noxious agents such as tobacco smoking. Up to 1/3 of COPD patients suffer at least one exacerbation/year, often of infectious nature, increasing the risk of relapse and the need for re-hospitalization. LRTI -acute bronchitis, bronchiolitis, influenza, pneumonia, COPD exacerbations- are the most deadly transmissible disease, found within the most common reasons for consultation in primary care and hospital settings, for antibiotic prescription, and one of the biggest reservoirs of multidrug resistant microorganisms.

Haemophilus influenzae is an important cause of LRTI, the most common bacterial cause of COPD airway infection, and responsible for about half of bacterial exacerbations. *H. influenzae* ampicillin-resistant is included in the WHO Global Priority List of pathogens for which the traditional direct-acting antibiotic approach is limited by antimicrobial resistance (AMR).

AMR causes increased illness duration and patient mortality rates, economical drain due to reduced productivity by sickness and increased treatment costs, and inability to do procedures that rely on antibiotics. The need for effective interventions to reduce the burden of infectious diseases has driven the Authorities to launch common Action Plans to combat AMR.

Aligned to these Plans, we work to develop scientific knowledge useful to develop innovative therapeutics whose application will facilitate improving the clinical management of respiratory infectious diseases. We focus on specific challenges posed by *H. influenzae*. Our approach is multidisciplinary and integrative, by combining microbial phenotyping, genetics, genomics and transcriptomics; molecular modeling and chemical synthesis; screening of therapeutic targets and drug testing up to pre-clinical evaluation. We work in contact with health, societal and industrial agents, aiming to make a step forward towards fighting bacterial respiratory infection.